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### A pictoral presentation of clues to possible vision problems

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## **A pictorial presentation of clues to possible vision problems**

### **Abstract**

A pictorial presentation of clues to possible vision problems

### **Degree Type**

Thesis

### **Degree Name**

Master of Science in Vision Science

### **Committee Chair**

Earle L. Hunter

### **Subject Categories**

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A PRE-DOCTORAL THESIS  
PRESENTED TO THE FACULTY  
OF THE COLLEGE OF OPTOMETRY

BY

TERRY M. HANSEN

KENT M ARCHIBALD

SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE  
DEGREE DOCTOR OF OPTOMETRY

1974

ACCEPTED BY Earle K. Hunter ob

DATE May 10, 1974

A PICTORIAL PRESENTATION  
OF CLUES TO  
POSSIBLE VISION PROBLEMS

In every busy classroom, in the course of every day, many seemingly insignificant bits of behavior are noticed by the teacher and then pushed to the back of her mind, to lie there half-forgotten because there is no opportunity at the moment to try to figure out what they might mean. For example, Billy always sits on a corner of his chair. Susie keeps rubbing her eyes. Graham blinks. Jane gets thirsty or must go to the bathroom or says she has a headache whenever there is something to copy from the blackboard. Luis won't wear his glasses. He keeps breaking or losing them or forgetting to bring them to school. Charles never looks at anything for more than a split second. Diana's eyes go out of alignment whenever she is under stress. Phillip always leads with his nose. Jenny's body rocks and weaves all day long. Mary looks under or over her glasses, never through them. (1)

## MISCELLANEOUS ITEMS FOR YOUR PRESENTATION

1. No teacher or parent can possibly have all the medical, psychological, sociological and other knowledge necessary for complete understanding of what makes each child in her class function as he does.
2. An intimate relationship exists between vision and school achievement, vision and social adjustment, vision and safety, vision and recreation, vision and total health.
3. Sixteen (16) per cent of the children ages 0-19 years have vision performance problems. (2)
4. The statistics show that thirteen (13) to sixteen (16) % of school age children still have undetected visual problems if only the Snellen test and gross observation are done in a screening program.
5. A complete, competent, professional eye examination is the ideal goal for every child, before entering school and at stated strategic intervals during school life. (3)
6. Eighty (80) per cent of the education of the child during the first twelve years is obtained through the use of the eyes. (4)
7. Poor families have seven times more visual impairment than

the general population. (5)

8. Every child's eyesight should be examined by the time he reaches the first grade.

9. No complete vision examination of a child can be done quickly. It often takes an hour or more for all of the necessary tests and sometimes more than one visit.

10. Many children can be taught to see properly by means of visual training.

11. An infants visual performance and its development can be examined as early as eighteen months, without drops or other restrictions.

12. There is no reason for a child in the United States to continue through life with a visual problem that can be corrected.

13. Juvenile court judges in several cities have noted the close relationship of vision to juvenile delinquency. The child who cannot see adequately loses interest in school work and often turns to anti-social behavior.

14. A child will gather more information of the world about him through his eyes than all the rest of the body. He depends more on sight than on hearing, taste, smell and feeling all put together.



15. The biggest fallacy of all is to "wait and see if he grows out of it."

16. Here are some signs of deficient vision in small children:

A. Visually being very unresponsive, showing little interest in looking at toys, or is not attracted by objects.

B. Holding things very close to see them. If this continues it is probably not childish fascination but poor vision.

C. Bumping into things, falling or stumbling over objects which should be easily seen.

D. One eye turning in or out. The eyes should stay straight.

E. Squinting to see, closing one eye, tilting head to inspect an object.

17. Many children may pass the usual school vision screening test and still have a vision problem requiring attention.

18. The observant parent along with the teacher must be on guard to spot the symptoms of eyestrain. Any child doing poorly in school or having marked vision symptoms requires investigation regardless of the results of any school vision test.

19. It is much better for a teacher to refer and err on a few cases than not to have referred those who need it.

20. The American Optometric Association recommends:

A. That all students in the lowest third of the class, particularly those with ability to achieve above their percentile rating, be referred for a complete vision analysis.

MISCELLANEOUS ITEMS FOR YOUR PRESENTATION

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B. That every student in the class who, even though achieving, is not working up to within reasonable limits of his own capacity be referred for a complete optometric examination.

A PICTORIAL PRESENTATION  
OF CLUES  
TO POSSIBLE  
VISION DIFFICULTIES

(Slide #1---crossed eyes) BETWEEN THE FIRST AND SIXTH YEARS AFTER BIRTH CROSSED EYES ARE MOST LIKELY TO OCCUR. ANY DEVIATION LASTING MORE THAN A FEW SECONDS OR HAPPENING WITH FREQUENCY IS ABNORMAL.

TURNED EYES DEMAND IMMEDIATE ATTENTION REGARDLESS OF THE CHILD'S AGE. PERMANENT LOSS OF VISION MAY OCCUR IN ONE EYE IF THAT EYE REMAINS TURNED FOR VERY LONG.

SOME CASES OF TURNED EYES CAN BE PREVENTED BY USE OF LENSES ALONE, PARTICULARLY IF CORRECTED BEFORE THE CHILD HAS BECOME WELL ADJUSTED TO THE ABNORMAL POSITION.

DURING THE LAST SEVERAL DECADES MUCH PROGRESS HAS BEEN MADE IN THE NON-SURGICAL TREATMENT OF TURNED EYES THROUGH VISUAL TRAINING.

THERE IS ONLY A VERY SMALL CHANCE THAT THE CHILD WILL EVER "GROW OUT OF IT."

(Slide #2---reddened or inflamed eye) THIS SLIDE IS AN EXAMPLE OF AN EYE INFECTION WHICH SHOULD HAVE IMMEDIATE REFERRAL FOR MEDICAL ATTENTION.



HOWEVER, THERE ARE CASES WHERE THE CHILD COMPLAINS CONSISTENTLY OF BURNING, ITCHING, RED EYES OR "CRUSTY" EYELIDS. THIS COULD BE A SYMPTOM OF VISUAL FATIGUE OR OTHER VISUAL PROBLEM. (THE EYE WOULD BE REDDENED TO A MUCH LESSER DEGREE)

(Slide #3---sty) STYES CAN HAVE TWO CAUSES. ONE IS FROM AN INF-  
ECTION OF THE SECRETORY GLANDS OF THE EYELIDS. ANOTHER IS UNCOR-  
RECTED VISUAL PROBLEMS. IN EITHER EVENT, WHEN THIS CONDITION IS  
NOTICED, THE CHILD SHOULD BE REFERRED FOR EVALUATION.

(Slide #4---squinting or thrusting forward of the head while look-  
ing at distant objects) CHILDREN WITH VISUAL PROBLEMS INVOLVING  
POOR DISTANCE VISION DO NOT KNOW THAT THEY CANNOT SEE AS WELL AS  
OTHER CHILDREN. SIGHT IS A PERSONAL EXPERIENCE, AND IT IS DIFFI-  
CULT FOR A CHILD TO COMPARE WHAT HE SEES WITH WHAT OTHER CHILDREN  
SEE.

IF THIS BEHAVIOR IS NOTED BY EITHER THE PARENT OR TEACHER, THE  
CHILD SHOULD BE REFERRED FOR OPTOMETRIC CARE AND SHOULD BE ALLOWED  
TO SIT AS CLOSE TO THE FRONT OF THE CLASS ROOM AS POSSIBLE.

(Slide #5---boy catching ball) AVOIDANCE OF CLOSE WORK IS ALSO  
A SIGN OF VISUAL PROBLEMS. OF COURSE, IT IS NATURAL FOR CHILD-  
REN TO PROBABLY ENJOY PLAYING MORE THAN STUDYING. HOWEVER, WHEN  
THE CHILD IS CONTINUALLY IGNORING AND NEGLECTING ANY CLOSE WORK,  
HIS VISUAL EVALUATION IS DEFINITELY RECOMMENDED.

JUVENILE COURT JUDGES IN SEVERAL CITIES HAVE NOTED THE CLOSE RELATIONSHIP OF VISION TO JUVENILE DELINQUENCY. THE CHILD WHO CANNOT SEE ADEQUATELY LOSES INTEREST IN SCHOOL WORK AND OFTEN TURNS TO ANTI-SOCIAL BEHAVIOR.

(Slide #6---boy looking out window) FREQUENT INATTENTION TO CLASSROOM WORK, BY CONSTANTLY LOOKING OUT WINDOW, DAYDREAMING, OR SHARPENING PENCILS, OR GOING TO THE BATHROOM CAN ALSO BE INDICATIONS OF AVOIDANCE OF CLOSE WORK WHICH IS POSSIBLY DUE TO EYE STRAIN OR FATIGUE.

(Slide #7---boy reading with head turned) CHILDREN WITH HEAD TURNS, SO THEY ARE LOOKING ONLY WITH ONE EYE, ARE TELLING US THAT IT IS DIFFICULT OR IMPOSSIBLE TO USE BOTH EYES TOGETHER. THIS COULD BE CAUSED FROM DISEASE OF THE EYE, FOCUS PROBLEMS OR MUSCLE PROBLEMS OF THE EYE. THESE CHILDREN USUALLY SUSPEND, OR GIVE UP COMPLETELY, THE VISION IN THAT EYE.

(Slide #8---boy with a head tilt) TILTING OF THE HEAD ONE WAY OR THE OTHER IS ALSO A BEHAVIOR INDICATION OF VISION DIFFICULTY. BECAUSE OF INADEQUATE VISION, THIS CHILD MUST MAKE MODIFICATIONS IN HIS POSTURE TO COMPENSATE FOR IT. MANY TIMES THERE IS ALSO A MODIFICATION OF PERSONALITY THAT ACCOMPANIES INADEQUATE VISION.

(Slide #9---boy with head on desk) ONCE AGAIN, WE CAN SEE A GROSS POSTURAL CHANGE TO COMPENSATE FOR A VISUAL PROBLEM. HAVE YOU EVER

TRIED READING LIKE THIS FOR ANY LENGTH OF TIME? TRY IT SOME TIME---  
SEE FOR YOURSELF HOW MUCH LESS YOU CAN SEE AND HOW MUCH HARDER IT  
IS TO SEE. THEN THINK OF THIS CHILD, BECAUSE OF SOME VISUAL PROBLEM,  
HE IS FORCED TO READ OR STUDY THIS WAY BECAUSE OF FATIGUE, DOUBLE  
VISION, OR SOME OTHER PROBLEM. NATURALLY, IT'S NOT THE BEST SOLUTION  
BUT IT IS THE ONE HE HAS "DISCOVERED TO COMPENSATE FOR INADEQUATE  
VISION.

(Slide #10---boy reading with book excessively close) THIS SLIDE  
IS OF A CHILD WHO IS READING WITH THE BOOK EXCESSIVELY CLOSE TO HIM.  
TYPICALLY, THIS CHILD ALSO HAS THE SYMPTOMS OF DOING EVERYTHING  
CLOSE TO HIM AND OF HAVING POOR VISION AT FAR.

IF THIS CONTINUES PAST A YOUNG AGE THEN IT IS NOT CHILDISH FASCIN-  
ATION, BUT POOR VISION. THIS IS A POSSIBLE EXAMPLE OF NEARSIGHTED-  
NESS (OR MYOPIA).

(Slide #11---girl scowling while reading) SCOWLING OR FROWNING  
WHILE READING OR PERFORMING ANY CLOSE WORK CAN BE A SIGN OF VISUAL  
STRESS OR FATIGUE. THE CHILD IS FORCING HERSELF TO READ BUT IS  
OBVIOUSLY NOT ENJOYING IT. MORE THAN LIKELY THERE IS A VISUAL  
PROBLEM INVOLVED.

(Slide #12---girl rubbing eyes) BURNING, ITCHING, REDDENED OR  
STINGY EYES ARE ALSO AN INDICATION OF VISUAL FATIGUE OR STRESS.  
IF SEEING CONDITIONS ARE GOOD, NORMAL EYES (AND THOSE PROPERLY

CORRECTED) CAN FUNCTION FOR LONG PERIODS OF TIME WITHOUT HARM OR FATIGUE.

(Slide # 13---boy covering one eye while reading) COVERING OF ONE EYE WHILE READING OR ATTEMPTING NEAR WORK IS ALSO AN INDICATION OF THE TWO EYES NOT BEING ABLE TO WORK TOGETHER. VISUAL ACUITY IN EITHER EYE MAY BE EXCELLENT, BUT BECAUSE OF MUSCLE OR PERCEPTUAL PROBLEMS, THE TWO EYES CANNOT BE USED SIMULTANEOUSLY. THIS IS VERY SIMILAR TO THE CHILD WHO TURNS HIS HEAD SO HE IS USING ONE EYE OR WHO LAYS HIS HEAD ON THE TABLE SO THAT ONLY ONE EYE IS USED. ALL ARE EXHIBITING AN AVOIDANCE RESPONSE. ALL ARE MAKING MODIFICATIONS IN THEIR BEHAVIOR BECAUSE THEY CAN'T GET ALONG WITH "NORMAL" RESPONSES. IN THESE CASES, MANY TIMES VISION IS SUSPENDED IN ONE EYE, BECAUSE THEY HAVE FOUND NO USE FOR TWO EYES. THEY FEEL THAT THEY MUST ALWAYS COVER ONE, SO WHY HAVE TWO?

(Slide #14---boy playing with world map) RESTLESSNESS, IRRITABILITY OR NERVOUSNESS AFTER OR DURING VISUAL CONCENTRATION ARE ALSO INDICATIONS OF POSSIBLE VISUAL DIFFICULTIES. ACUITY MAY BE EXCELLENT, BUT AS THE EYES ARE REQUIRED TO WORK TOGETHER, OR TO MAINTAIN INTENSE CONCENTRATION, RESTLESSNESS AND IRRITABILITY INCREASE.

(Slide #15---girl using finger to read) USE OF THE FINGER TO KEEP PLACE WHILE READING (AND/OR LOSS OF PLACE WHILE READING) CAN BE AN INDICATION OF PROBLEMS OR COORDINATION OF THE TWO EYES. BECAUSE OF THIS



THE CHILD MUST HAVE SOME KINESTHETIC FEEDBACK SO WON'T LOSE HIS PLACE.

OFTEN CHILDREN WILL DO WELL IN MATH AND OTHER SUBJECTS WHICH DO NOT REQUIRE QUICK, COORDINATED, SCANNING MOVEMENTS OF THE EYES. BUT WHEN THEY ARE REQUIRED TO HAVE CONTINUAL ATTENTION TO THE PAGE (AS IN READING) THEIR VISUAL ABILITIES FALL APART.

INADEQUATE VISION IS PROBABLY THE GREATEST SINGLE CAUSE OF POOR SCHOLARSHIP AMONG CHILDREN OF NORMAL INTELLIGENCE.

(Slide # 16---reading test paper) THIS PAPER IS AN EXAMPLE OF A READING AND COMPREHENSION TEST. AS CAN BE SEEN FROM THE SCORES, JILL ANYBODY DEFINITELY HAS PROBLEMS WITH HER READING ABILITY.

A CHILD WITH A VISION PROBLEM IS LIKELY TO BE LOW IN THE COMPREHENSION OF WHAT HE READS.

IN 1970, THE UNITED STATES COMMISSIONER OF EDUCATION REPORTED THAT ONE-HALF OF THE UNDER-21 UNEMPLOYED REPORTEDLY READ AT LESS THAN A FIFTH GRADE LEVEL AND THAT THREE-FOURTHS OF ALL YOUNGSTERS REFERRED TO JUVENILE COURT IN NEW YORK CITY ARE TWO YEARS OR MORE BELOW THEIR GRADE LEVEL IN READING.

(Slide #17---similar word list) CONFUSION OF SIMILAR WORDS, OR PERSISTENT REVERSALS AFTER THE SECOND GRADE INDICATE POSSIBLE



VISUO-PERCEPTUAL PROBLEMS. THE LIST HERE IS FROM AN ACTUAL CASE AT THE PACIFIC UNIVERSITY COLLEGE OF OPTOMETRY VISUAL TRAINING CLINIC. THE GIRL REFERRED TO COULD NOT DISTINGUISH BETWEEN THE WORDS LISTED. IS IT ANY WONDER SHE COULD NOT READ OR COMPREHEND WHAT WAS READ?

IT REQUIRES MORE THAN 20/20 VISION TO LEARN FROM THE PRINTED PAGE. WHEN WE SPEAK OF VISION WE MUST BE CONCERNED WITH THE CHILD'S ABILITY TO GET MEANING AND UNDERSTANDING FROM WHAT HE SEES BY THE SKILLFUL AND EFFICIENT USE OF BOTH EYES.

(Slide #18---boy dropping baseball) IN CHILDREN, VISUAL DEFECTS OFTEN EXPRESS THEMSELVES AS A LACK OF COORDINATION, VARIOUS FORMS OF AWKWARDNESS, HESITATIONS AND FAULTY TIMING.

POOR HAND-EYE-BODY COORDINATION CAN BE INDICATED ON THE PLAYGROUND OR IN THE CLASSROOM. SOME EXAMPLES MIGHT BE POOR PENMANSHIP, INABILITY TO DRAW VARIOUS FORMS OR DISORIENTATION OF FIGURES AND WORDS.

(Slide #19---uphill writing) UPHILL OR DOWNHILL WRITING MAY ALSO BE INDICATIVE OF POOR EYE-HAND COORDINATION.

(Slide #20---girl rubbing head) HEADACHES, FATIGUE, POOR SCHOLASTIC ACHIEVEMENT MAY OCCUR FROM USE OF EYES THAT CAN SEE CLEARLY AT FAR OR NEAR, BUT DO SO IN AN UNCOORDINATED AND INEFFICIENT MANNER.

CLINICALLY, HEADACHES AND EYESTRAIN ARE VERY COMMON COMPLAINTS OF THOSE WITH SEEMINGLY MINOR MUSCLE IMBALANCES OF THE TWO EYES OR OF THOSE WITH POOR FOCUSING ABILITY.

(Slide #21---blur of the chalkboard) CHILDREN WITH VISUAL PROBLEMS INVOLVING DISTANCE VISION DO NOT KNOW THAT THEY CANNOT SEE AS WELL AS OTHER CHILDREN. SIGHT IS A PERSONAL EXPERIENCE, AND IT IS DIFFICULT FOR A CHILD TO COMPARE WHAT HE SEES WITH WHAT OTHER CHILDREN SEE.

BLUR AT FAR IS A COMMON SYMPTOM OF NEARSIGHTEDNESS (MYOPIA). STUDIES HAVE SHOWN THAT NEARSIGHTEDNESS HAS A TENDENCY TO PROGRESS WITH PROLONGED NEAR WORK. CHILDREN WHO HAVE BEEN LABELLED AS "BOOKWORMS" MAY BE "BOOKWORMS" BECAUSE THEY HAVE NO OTHER CHOICE. IF THEY CANNOT SEE FAR AWAY THEY HAVE NO OTHER PLACE TO PERFORM BUT AT NEAR.

(Slide #22---blur of reading material) BLUR AT NEAR OR PROBLEMS IN MAINTAINING FOCUS ON READING MATERIAL IS A POSSIBLE INDICATION OF FARSIGHTEDNESS (HYPEROPIA).

COMMON COMPLAINTS WOULD BE BLUR, WORDS RUNNING TOGETHER, JUMPING, OR WRIGGLING.

(Slide #23---double words) DIPLOPIA (DOUBLE VISION) IS A COMMON WHEN THERE IS POOR COORDINATION OF THE TWO EYES. IF THE

EYES ARE CROSSED OR WALL-EYED, DIPLOPIA MAY BE THE COMPLAINT.

LENSES, PATCHES, EYE EXERCISES, VISUAL TRAINING, AND SURGERY ARE USED TO CORRECT TURNED EYES. UNLESS VISUAL TRAINING IS USED, THERE IS LITTLE CHANCE THE CHILD WILL HAVE NORMAL, TWO-EYED VISION ALTHOUGH THE EYES MAY APPEAR TO BE STRAIGHT.



"Although, from long custom, we accept the conditions under which we live today as normal, it by no means follows that the eye has evolved to cope with them, and the fact that it is able as a rule to meet the demands which are made upon it, is a compliment of no mean order to the extreme adaptability of living organisms. It is not surprising, therefore, that of all the ailments which interfere with the smooth running of the human machine, eye-strain in one form or another is one of the most common.

The ill-advised statements of a few should not result in our ignoring the fact that errors of refraction, more especially of small amount, anomalies of focusing and convergence, and a lack of balance between the extrinsic ocular muscles, are the unsuspected cause of much discomfort. Too often in the diagnosis of such cases the ocular cause of the trouble is neglected or thought of ultimately as a last expedient when frequently it should have been considered and remedied first.

Two factors contribute largely to this failure in rational treatment. From the symptoms offered by the patient, eye-strain may not easily be suspected, for many of them are referred and seem to bear little or no relation to an ocular origin. Further, in a great many cases the vision, as judged by the patient's own standard, may be unimpaired, or indeed, it may be considered above the normal. But it is to be remembered that as a general rule the most distress is caused by errors so slight that they readily escape detection unless they are looked for specially. When a gross anomaly exists and vision is blurred and indistinct,

the visual apparatus reconciles itself to its disability without any attempt to improve the condition; the matter thus begins and ends with an impairment of vision; the diagnosis is apparent and the treatment obvious. But when the error is small the patient is able to rectify it to a greater or less extent by muscular effort; this he continually attempts to do to the best of his ability, and the constant strain thus involuntarily imposed upon him brings on muscular and nervous fatigue with its attendant train of reflex symptoms. It is not the error itself which causes the trouble so much as the continuous effort called forth automatically in the attempt to correct it. The physician may suspect that a symptom-complex may be attributable to the eyes, and on his suggestion the patient will protest that his vision is excellent; but examination will show that an unsuspected error of refraction or some muscular imbalance is present, and its correction will frequently result in an equally unexpected and dramatic relief.

The ocular symptoms associated with eye-strain are directly due to the increased muscular work which the defect invokes and the discomfort of the resultant muscular fatigue, to which may be added the effects of a condition of vascular engorgement determined by this state of sustained and forced activity. Subjectively, especially after long periods of close application to work, the eyes feel tired, hot and uncomfortable; temporary relief is obtained by resting or by rubbing them, but if the work is continued, the vague discomfort gives place to a feeling of actual

strain and this may develop into pain. Pain in the eyes unconnected with inflammation is generally due to eye-strain and rarely to any deep-seated disease. It is usually mild and aching, but may on occasion be severe and acute; it may be situated in the eyes themselves or be located more deeply in the orbits, or spreading therefrom, become referred as a general headache." (6)

THE SLIDES FOR THIS PRESENTATION WILL BE KEPT IN THE LEARNING  
RESOURCES CENTER AT PACIFIC UNIVERSITY COLLEGE OF OPTOMETRY.

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